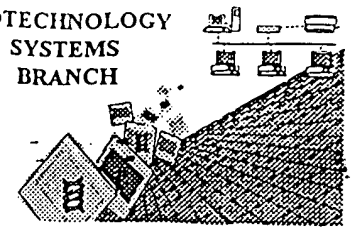
BIOTECHNOLOGY SYSTEMS BRANCH



IFW

RAW SEQUENCE LISTING ERROR REPORT

The Biotechnology Systems Branch of the Scientific and Technical Information Center (STIC) detected errors when processing the following computer readable form:

Application Serial Number: 10/659,980
Source: OIPE
Date Processed by STIC: 9-22-03

THE ATTACHED PRINTOUT EXPLAINS DETECTED ERRORS.
PLEASE FORWARD THIS INFORMATION TO THE APPLICANT BY EITHER:

1) INCLUDING A COPY OF THIS PRINTOUT IN YOUR NEXT COMMUNICATION TO THE APPLICANT, WITH A NOTICE TO COMPLY or,
2) TELEPHONING APPLICANT AND FAXING A COPY OF THIS PRINTOUT, WITH A NOTICE TO COMPLY

FOR CRF SUBMISSION AND PATENTIN SOFTWARE QUESTIONS, PLEASE CONTACT MARK SPENCER, 703-308-4212.

TO REDUCE ERRORED SEQUENCE LISTINGS, PLEASE USE THE CHECKER VERSION 4.0 PROGRAM, ACCESSIBLE THROUGH THE U.S. PATENT AND TRADEMARK OFFICE WEBSITE. SEE BELOW FOR ADDRESS:

http://www.uspto.gov/web/offices/pac/checker

Applicants submitting genetic sequence information electronically on diskette or CD-Rom should be aware that there is a possibility that the disk/CD-Rom may have been affected by treatment given to all incoming mail.
Please consider using alternate methods of submission for the disk/CD-Rom or replacement disk/CD-Rom.
Any reply including a sequence listing in electronic form should NOT be sent to the 20231 zip code address for the United States Patent and Trademark Office, and instead should be sent via the following to the indicated addresses:

1. EFS-Bio (<http://www.uspto.gov/ebc/efs/downloads/documents.htm> , EFS Submission User Manual - ePAVE)
2. U.S. Postal Service: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450
3. Hand Carry directly to:
   U.S. Patent and Trademark Office, Technology Center 1600, Reception Area, 7th Floor, Examiner Name, Sequence Information, Crystal Mall One, 1911 South Clark Street, Arlington, VA 22202
   Or
   U.S. Patent and Trademark Office, Box Sequence, Customer Window, Lobby, Room 1B03, Crystal Plaza Two, 2011 South Clark Place, Arlington, VA 22202
4. Federal Express, United Parcel Service, or other delivery service to: U.S. Patent and Trademark Office, Box Sequence, Room 1B03-Mailroom, Crystal Plaza Two, 2011 South Clark Place, Arlington, VA 22202

Revised 04/24/2003

Raw Sequence Listing Error Summary

ERROR DETECTED	SUGGESTED CORRECTION	SERIAL NUMBER: 10/659,980

ATTN: NEW RULES CASES: PLEASE DISREGARD ENGLISH "ALPHA" HEADERS, WHICH WERE INSERTED BY PTO SOFTWARE

1	Wrapped Nucleics Wrapped Aminos	The number/text at the end of each line "wrapped" down to the next line. This may occur if your file was retrieved in a word processor **after** creating it. Please adjust your right margin to .3; this will prevent "wrapping."
2	Invalid Line Length	The rules require that a line **not exceed** 72 characters in length. This includes white spaces.
3	Misaligned Amino Numbering	The numbering under each 5th amino acid is misaligned. Do **not** use tab codes between numbers; use **space characters**, instead.
4	Non-ASCII	The submitted file was **not** saved in ASCII(DOS) text, as **required** by the Sequence Rules. **Please ensure your subsequent submission is saved in ASCII text.**
5	Variable Length	Sequence(s)____contain n's or Xaa's representing more than one residue. **Per Sequence Rules, each n or Xaa can only represent a single residue.** Please present the **maximum** number of each residue having variable length and indicate in the <220>-<223> section that some may be missing.
6	PatentIn 2.0 "bug"	A "bug" in PatentIn version 2.0 has caused the <220>-<223> section to be missing from amino acid sequences(s) _____. Normally, PatentIn would automatically generate this section from the previously coded nucleic acid sequence. Please manually copy the relevant <220>-<223> section to the subsequent amino acid sequence. **This applies to the mandatory <220>-<223> sections for Artificial or Unknown sequences.**
7	Skipped Sequences (OLD RULES)	Sequence(s) _____ missing. If intentional, please insert the following lines for **each** skipped sequence: (2) INFORMATION FOR SEQ ID NO:X: (insert SEQ ID NO where "X" is shown) (i) SEQUENCE CHARACTERISTICS: (Do not insert any subheadings under this heading) (xi) SEQUENCE DESCRIPTION:SEQ ID NO:X: (insert SEQ ID NO where "X" is shown) This sequence is intentionally skipped Please also adjust the "(ii) NUMBER OF SEQUENCES:" response to **include** the skipped sequences.
8	Skipped Sequences (NEW RULES)	Sequence(s) _____ missing. If **intentional**, please insert the following lines for **each** skipped sequence. <210> sequence id number <400> sequence id number 000
9	Use of n's or Xaa's (NEW RULES)	Use of n's and/or Xaa's have been detected in the Sequence Listing. Per 1.823 of Sequence Rules, use of <220>-<223> is MANDATORY if n's or Xaa's are present. In <220> to <223> section, please explain location of **n** or **Xaa**, and which residue **n** or **Xaa** represents.
10 X	Invalid <213> Response	Per 1.823 of Sequence Rules, the only **valid** <213> responses are: Unknown, Artificial Sequence, or scientific name (Genus/species). <220>-<223> section is **required** when <213> response is Unknown or is Artificial Sequence
11	Use of <220>	Sequence(s) _____ missing the <220> "Feature" and associated numeric identifiers and responses. Use of <220> to <223> is MANDATORY if <213> "Organism" response is "Artificial Sequence" or "Unknown." Please explain source of genetic material in <220> to <223> section. (See "Federal Register," 07/01/1998, Vol. 63, No. 104, pp. 29631-32) (Sec. 1.823 of Sequence Rules)
12	PatentIn 2.0 "bug"	Please do not use "Copy to Disk" function of PatentIn version 2.0. This causes a corrupted file, resulting in missing mandatory numeric identifiers and responses (as indicated on raw sequence listing). Instead, please use "File Manager" or any other manual means to copy file to floppy disk.
13	Misuse of n/Xaa	"n" can **only** represent a single nucleotide; "Xaa" can **only** represent a single amino acid

OIPE

RAW SEQUENCE LISTING DATE: 09/22/2003
PATENT APPLICATION: **US/10/659,980** TIME: 14:16:53

Input Set : **A:\81289-284781.ST25.txt**
Output Set: **N:\CRF4\09222003\J659980.raw**

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     3 <110> APPLICANT: Hovanec, Timothy A
     5 <120> TITLE OF INVENTION: Method for Detecting Ammonia-Oxidizing Bacteria
     7 <130> FILE REFERENCE: 81289-284781
C--> 9 <140> CURRENT APPLICATION NUMBER: US/10/659,980
C--> 9 <141> CURRENT FILING DATE: 2003-09-10
     9 <150> PRIOR APPLICATION NUMBER: US 09/573,684
    10 <151> PRIOR FILING DATE: 2000-05-19
    12 <150> PRIOR APPLICATION NUMBER: US 60/386,217
    13 <151> PRIOR FILING DATE: 2002-09-19
    15 <150> PRIOR APPLICATION NUMBER: US 60/386,218
    16 <151> PRIOR FILING DATE: 2002-09-19
    18 <150> PRIOR APPLICATION NUMBER: US 60/386,219
    19 <151> PRIOR FILING DATE: 2002-09-19
    21 <160> NUMBER OF SEQ ID NOS: 23
    23 <170> SOFTWARE: PatentIn version 3.2
    25 <210> SEQ ID NO: 1
    26 <211> LENGTH: 1457
    27 <212> TYPE: DNA
    28 <213> ORGANISM: AOB Type A R7clone140 16S rDNA (SEQ ID NO:1)
    30 <400> SEQUENCE: 1
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    33 ctggtggcga gtggcggacg ggtgagtaat gcatcggaac gtatccagaa gaggggggta   120
    35 acgcatcgaa agatgtgcta ataccgcata tactctaagg aggaaagcag gggatcgaaa   180
    37 gaccttgcgc ttttggagcg gccgatgtct gattagctag ttggtggggt aaaggcctac   240
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    41 gcccagactc ctacgggagg cagcagtggg gaattttgga caatgggcgc aagcctgatc   360
    43 cagcaatgcc gcgtgagtga agaaggcctt cgggttgtaa agctctttca gtcgagaaga   420
    45 aaaggttacg gtaaataatc gtgactcatg acggtatcga cagaagaagc accggctaac   480
    47 tacgtgccag cagccgcggt aatacgtagg gtgcaagcgt taatcggaat tactgggcgt   540
    49 aaagggtgcg caggcggctt tgtaagtcag atgtgaaatc cccgggctta acctgggaat   600
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    53 tgaaatgcgt agagatatgg aagaacatcg atggcgaagg cagcctcctg ggttaacact   720
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    57 ctaaacgatg tcaactagtt gttgggcctt attaggcttg gtaacgaagc taacgcgtga   840
    59 agttgaccgc ctggggagta cggtcgcaag attaaaactc aaaggaattg acggggaccc   900
    61 gcacaagcgg tggattatgt ggattaattc gatgcaacgc gaaaaacctt acctaccctt   960
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    65 catggctgtc gtcagctcgt gtcgtgagat gttgggttaa gtcccgcaac gagcgcaacc  1080
    67 cttgtcatta attgccatca tttggttggg cactttaatg agactgccgg tgacaaaccg  1140
    69 gaggaaggtg gggatgacgt caagtcctca tggcccttat gggtagggct tcacacgtaa  1200
    71 tacaatggcg cgtacagagg gttgccaacc cgcgaggggg agctaatctc agaaagcgcg  1260
    73 tcgtagtccg gatcggagtc tgcaactcga ctccgtgaag tcggaatcgc tagtaatcgc  1320
    75 ggatcagcat gtcgcggtga atacgttccc gggtcttgta cacaccgccc gtcacaccat  1380
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Does Not Comply
Corrected Diskette Needed

see item 10 on error summary report.

RAW SEQUENCE LISTING DATE: 09/22/2003
PATENT APPLICATION: **US/10/659,980** TIME: 14:16:53

Input Set : **A:\81289-284781.ST25.txt**
Output Set: **N:\CRF4\09222003\J659980.raw**

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79 gattcatgac tggggtg 1457
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84 <212> TYPE: DNA
85 <213> ORGANISM: AOB Type A1 R7clone187 16S rDNA (SEQ ID NO:2)
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92 acgcatcgaa agatgtgcta ataccgcata tactctaagg aggaaagcag gggatcgaaa 180
94 gaccttgcgc ttttggagcg gccgatgtct gattagctag ttggtggggt aaaggcctac 240
96 caaggcgacg atcagtagtt ggtctgagag gacgaccagc cacactggga ctgagacacg 300
98 gcccagactc ctacgggagg cagcagtggg gaattttgga caatgggcgc aagcctgatc 360
100 cagcaatgcc gcgtgagtga agaaggcctt cgggttgtaa agctctttca gtcgagaaga 420
102 aaaggttacg gtaaataatc gtgacccatg acggtatcga cagaagaagc accggctaac 480
104 tacgtgccag cagccgcggt aatacgtagg gtgcaagcgt taatcggaat tactgggcgt 540
106 aaagggtgcg caggcggcct tgtaagtcag atgtgaaatc cccgggctta acctgggaat 600
108 tgcgtttgaa actacaaagc tagagtgtgg cagagggagg tggaattcca tgtgtagcag 660
110 tgaaatgcgt agagatatgg aagaacatcg atggcgaagg cagcctcctg ggttaacact 720
112 gacgctcatg cacgaaagcg tggggagcaa acaggattag ataccctggt agtccacgcc 780
114 ctaaacgatg tcaactagtt gttgggcctt attaggcttg gtaacgaagc taacgcgtga 840
116 agttgaccgc ctggggagta cggtcgcaag attaaaactc aaaggaattg acggggaccc 900
118 gcacaagcgg tggattatgt ggattaattc gatgcaacgc gaaaaacctt acctaccctt 960
120 gacatgtagc gaattttcta gagatagatt agtgcttcgg gaacgctaac acaggtgctg 1020
122 catggctgtc gtcagctcgt gtcgtgagat gttgggttaa gtcccgcaac gagcgcaacc 1080
124 cttgtcatta attgccatca tttggttggg cactttaatg agactgccgg tgacaaaccg 1140
126 gaggaaggtg gggatgacgt caagtcctca tggcccttat gggtagggct tcacacgtaa 1200
128 tacaatggcg cgtacagagg gttgccaacc cgcgaggggg agctaatctc agaaagcgcg 1260
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147 ggtggcgagt ggcgaacggg tgagtaatac atcggaacgt atcttcgagg gggggataac 120
149 gcaccgaaag gtgtgctaat accgcataat ctccacggag aaaagcaggg gatcgcaaga 180
151 ccttgcgctc ttggagcggc cgatgtctga ttagctagtt ggtgaggtaa tggcttacca 240
153 aggcgacgat cagtagctgg tctgagagga cgaccagcca cactgggact gagacacggc 300
155 ccagactcct acgggaggca gcagtgggga attttggaca atgggggaaa ccctgatcca 360
157 gccatgccgc gtgagtgaag aaggccttcg ggttgtaaag ctctttcagc cggaacgaaa 420
159 cggtcacggc taatacccgt gactactgac ggtaccggaa gaagaagcac cggctaacta 480
161 cgtgccagca gccgcggtaa tacgtagggt gcaagcgtta atcggaatta ctgggcgtaa 540
163 agcgtgcgca ggcggttttg taagtcagat gtgaaagccc cgggcttaac ctgggaactg 600
165 cgtttgaaac tacaaggcta gagtgtggca gagggggggtg gaattccacg tgtagcagtg 660
167 aaatgcgtag agatgtggag gaacaccgat ggcgaaggca gccccctggg ttaacaccga 720

RAW SEQUENCE LISTING DATE: 09/22/2003
PATENT APPLICATION: **US/10/659,980** TIME: 14:16:53

Input Set : **A:\81289-284781.ST25.txt**
Output Set: **N:\CRF4\09222003\J659980.raw**

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173 ttggccgcct ggggagtacg gtcgcaagat taaaactcaa aggaattgac ggggacccgc    900
175 acaagcggtg gattatgtgg attaattcga tgcaacgcga aaaaccttac ctacccttga    960
177 catgtaccga agcccgccga gaggtgggtg tgcccgaaag ggagcggtaa cacaggtgct   1020
179 gcatggctgt cgtcagctcg tgtcgtgaga tgttgggtta agtcccgcaa cgagcgcaac   1080
181 ccttgtcatt aattgccatc attcagttgg gcactttaat gaaactgccg gtgacaaacc   1140
183 ggaggaaggt ggggatgacg tcaagtcctc atggcccttа tgggtagggc ttcacacgta   1200
185 atacaatggc gcgtacagag ggttgccaac ccgcgagggg gagctaatct cagaaagcgc   1260
187 gtcgtagtcc ggatcggagt ctgcaactcg actccgtgaa gtcggaatcg ctagtaatcg   1320
189 cggatcagca tgtcgcggtg aatacgttcc cgggtcttgt acacaccgcc cgtcacacca   1380
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197 <211> LENGTH: 1460
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206 gcatcgaaag atgtgctaat accgcatatc tctgaggaga aaagcagggg atcgcaagac    180
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210 ggcaacgatc agtagttggt ctgagaggac gaccaaccac actgggactg agacacggcc    300
212 cagactccta cgggaggcag cagtggggaa ttttggacaa tgggcgaaag cctgatccag    360
214 ccatgccgcg tgagtgaaga aggccttcgg gttgtagagc tcttttagtc agaaagaaag    420
216 aatcatgatg aataattatg atttatgacg gtactgacag aaaaagcacc ggctaactac    480
218 gtgccagcag ccgcggtaat acgtagggtg cgagcgttaa tcggaattac tgggcgtaaa    540
220 gggtgcgcag gcggttttgt aagtcagatg tgaaagcccc gggcttaacc tgggaattgc    600
222 gtttgaaact acaaggctag agtgcagcag aggggagtgg aattccatgt gtagcagtga    660
224 aatgcgtaga gatgtggaag aacaccgatg gcgaaggcag ctccctgggt tgacactgac    720
226 gctcatgcac gaaagcgtgg ggagcaaaca ggattagata ccctggtagt ccacgcccta    780
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230 gttgaccgcc tggggagtac ggtcgcaaga ttaaaactca aaggaattga cggggacccg    900
232 cacaagcggt ggattatgtg gattaattcg atgcaacgcg aaaaaccttа cctacccttg    960
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246 cgcggatcag catgccgcgg tgaatacgtt cccgggtctt gtacacaccg cccgtcacac   1380
248 catgggagtg gttttcacca gaagcaggta gtttaaccgt aaggaggacg cttgccacgg   1440
250 tgggggtcat gactggggtg                                              1460
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254 <211> LENGTH: 18
255 <212> TYPE: DNA
256 <213> ORGANISM: Oligonucleotide Probe (SEQ ID NO:5)
258 <400> SEQUENCE: 5
259 ccccccctctt ctggatac                                                18
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RAW SEQUENCE LISTING DATE: 09/22/2003
PATENT APPLICATION: **US/10/659,980** TIME: 14:16:53

Input Set : **A:\81289-284781.ST25.txt**
Output Set: **N:\CRF4\09222003\J659980.raw**

262 <210> SEQ ID NO: 6
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268 cggaacgtat ccagaaga 18
271 <210> SEQ ID NO: 7
272 <211> LENGTH: 18
273 <212> TYPE: DNA
274 <213> ORGANISM: PCR primer (SEQ ID NO:7)
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281 <211> LENGTH: 19
282 <212> TYPE: DNA
283 <213> ORGANISM: Oligonucleotide probe (SEQ ID NO:8)
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286 tcccccactc gaagatacg 19
289 <210> SEQ ID NO: 9
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292 <213> ORGANISM: PCR primer (SEQ ID NO:9) Same error
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295 atcggaacgt atcttcg 17
298 <210> SEQ ID NO: 10
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304 ccacctctcr gcgggc 16
307 <210> SEQ ID NO: 11
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310 <213> ORGANISM: PCR primer (SEQ ID NO:11)
312 <400> SEQUENCE: 11
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316 <210> SEQ ID NO: 12
317 <211> LENGTH: 19
318 <212> TYPE: DNA
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321 <400> SEQUENCE: 12
322 gtctccayta gattccaag 19
325 <210> SEQ ID NO: 13
326 <211> LENGTH: 17
327 <212> TYPE: DNA
328 <213> ORGANISM: PCR primer (SEQ ID NO:13)
330 <400> SEQUENCE: 13
331 gtttgatcct ggctcag 17
334 <210> SEQ ID NO: 14

RAW SEQUENCE LISTING DATE: 09/22/2003
PATENT APPLICATION: **US/10/659,980** TIME: 14:16:53

Input Set : **A:\81289-284781.ST25.txt**
Output Set: **N:\CRF4\09222003\J659980.raw**

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337 <213> ORGANISM: PCR primer (SEQ ID NO:14)
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344 <211> LENGTH: 17
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355 <213> ORGANISM: PCR primer (SEQ ID NO:16)
357 <400> SEQUENCE: 16
358 gwattaccgc ggckgctg 18
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362 <211> LENGTH: 20
363 <212> TYPE: DNA
364 <213> ORGANISM: PCR primer (SEQ ID NO:17)
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367 cactctagcy ttgtagtttc 20
370 <210> SEQ ID NO: 18
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373 <213> ORGANISM: N. Aestuarii-like AOB P4clone42 16S rDNA (SEQ ID NO:18)
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386 tgggactgag acacggccca gactcctacg ggaggcagca gtggggaatt ttggacaatg 360
388 ggcgaaagcc tgatccagca atgccgcgtg agtgaagaag gcttcgggtt gtaaagctct 420
390 ttcagtcgag aagaaaaggt tgtgactaat aatcacaact tatgatggta ccgacagaag 480
392 aagcaccggc taactacgtg ccagcagccg cggtaatacg tagggtgcaa gcgttaatcg 540
394 gaattactgg gcgtaaaggg tgcgcaggcg gctttgtaag tcagatgtga aatccccggg 600
396 cttaacctgg gaattgcgtt tgaaactaca aagctagagt gtagcagagg ggggtggaat 660
398 tccatgtgta gcagtgaaat gcgtagagat atggaagaac atcgatggcg aaggcagccc 720
400 cctgggttaa cactgacgct catgcacgaa agcgtgggga gcaaacagga ttagataccc 780
402 tggtagtcca cgccctaaac gatgtcaact agttgttggg ccttactagg cttggtaacg 840
404 tagctaacgc gtgaagttga ccgcctgggg agtacggtcg caggattaaa actcaaagga 900
406 attgacgggg acccgcacaa gcggtggatt atgtggatta attcgatgca acgcgaaaaa 960
408 ccttacctac ccttgacatg tagcgaatat tttagagata aaatagtgcc ttcgggaacg 1020
410 ctaacacagg tgctgcatgg ctgtcgtcag ctcgtgtcgt gagatgttgg gttaagtccc 1080
412 gcaacgagcg caacccttgt cattaattgc catcatttag ttgggcactt taatgagact 1140
414 gccggtgaca aaccggagga aggtggggat gacgtcaagt cctcatggcc cttatgggta 1200
416 gggcttcaca cgtaatacaa tggcgcgtac agagggttgc caacccgcga gggggagcta 1260

VERIFICATION SUMMARY DATE: 09/22/2003
PATENT APPLICATION: **US/10/659,980** TIME: 14:16:54

Input Set : **A:\81289-284781.ST25.txt**
Output Set: **N:\CRF4\09222003\J659980.raw**

L:9 M:270 C: Current Application Number differs, Replaced Current Application No
L:9 M:271 C: Current Filing Date differs, Replaced Current Filing Date